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(54) **ROTOR ASSEMBLY OF ELECTRONIC WATER PUMP AND ELECTRONIC WATER PUMP**

(57) A rotor assembly of an electronic water pump and an electronic water pump comprising the rotor assembly. The rotor assembly comprises: a bearing assembly (1), a magnetic ring assembly (2), an impeller seat (3), and an impeller cover (4). The bearing assembly (1) has a first central through hole (11); an end portion of the bearing assembly (1) is provided with a first limiting portion (12); the magnetic ring assembly (2) is sleeved on and in interference connection with the bearing assembly (1); at least one end of the bearing assembly (1) extends out of the magnetic ring assembly (2); the impeller seat (3) covers the end portion of the bearing assembly (1); and the impeller seat (3) is provided with a second limiting portion (31) in limiting fit with the first limiting portion (12). According to the rotor assembly, the number of times of injection molding of the rotor assembly is reduced, and the dynamic balance precision of the rotor assembly is ensured.

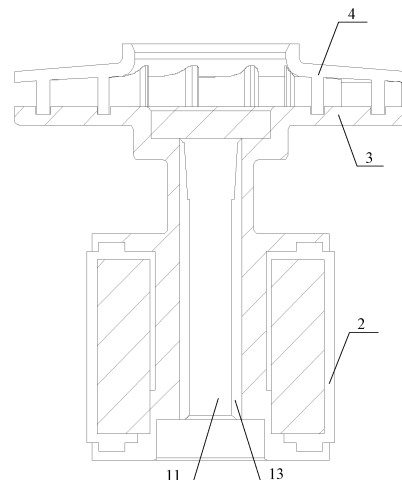


FIG. 1

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Description

CROSS REFERENCE TO RELATED APPLICATION

[0001] The present disclosure claims priority to the Chinese patent application titled "Rotor Assembly of Electronic Water Pump and Electronic Water Pump" with application number 202122906945.8 filed on November 22, 2021, the content of which is incorporated herein by reference in its entirety.

TECHNICAL FIELD

[0002] The present disclosure relates to the technical field of electronic water pumps, and specifically to a rotor assembly of an electronic water pump and an electronic water pump.

BACKGROUND

[0003] The rotor assembly is the core component of the electronic water pump. When the electronic water pump is in operation, the rotor assembly is energized and converts its own mechanical energy into the kinetic energy of the fluid. The quality of the rotor assembly seriously affects the efficiency of the electronic water pump. For example, if the dynamic balance accuracy of the rotor assembly is poor, it will cause vibration of the electronic water pump, reduce the service life of the electronic water pump, and cause greater noise and environmental pollution.

[0004] It should be noted that the information disclosed in the above background section is only used to enhance understanding of the background of the present disclosure, and therefore may include information that does not constitute prior art known to those of ordinary skill in the art.

SUMMARY

[0005] It is an object of the present disclosure to provide a rotor assembly of an electronic water pump and an electronic water pump, which can ensure the dynamic balancing accuracy of the rotor assembly, improve the service life of the electronic water pump, and at the same time reduce noise pollution.

[0006] According to an aspect of the present disclosure, there is provided a rotor assembly of an electronic water pump, including:

a bearing assembly including a first central through hole, where the first central through hole is configured to be sleeved on a rotating shaft, and an end of the bearing assembly has a first limiting part; a magnetic ring assembly sleeved on the bearing assembly, where the magnetic ring assembly is interference-fitted with the bearing assembly, and at least one end of the bearing assembly extends out

of the magnetic ring assembly; an impeller seat wrapping the end of the bearing assembly, where the impeller seat has a second limiting part in limiting fit with the first limiting part; and an impeller cover fixedly connected to a side of the impeller seat away from the bearing assembly.

[0007] According to the rotor assembly of an embodiment of the present disclosure, the bearing assembly includes a shaft sleeve, and the impeller seat has a bushing extending along the axial direction of the shaft sleeve and fitting with a hole wall of the first central through hole.

[0008] According to the rotor assembly of an embodiment of the present disclosure, a material of the impeller seat includes polyphenylene sulfide.

[0009] According to the rotor assembly of an embodiment of the present disclosure, the bearing assembly includes a shaft sleeve and a bearing;

the bearing has the first central through hole, the shaft sleeve is sleeved on the bearing and is interference-fitted with the bearing; and the impeller seat wraps at least one of an end of the bearing and an end of the shaft sleeve.

[0010] According to the rotor assembly of an embodiment of the present disclosure, the bearing is a graphite bearing.

[0011] According to the rotor assembly of an embodiment of the present disclosure, one of an outer wall of the bearing and an inner wall of the shaft sleeve has a groove, and the other has a protrusion limited in the groove.

[0012] According to the rotor assembly of an embodiment of the present disclosure, at least one of an outer wall of the bearing and an outer wall of the shaft sleeve has the first limiting part.

[0013] According to the rotor assembly of an embodiment of the present disclosure, a side wall of the end of the bearing assembly has a plurality of first limiting parts in a circumferential direction, and the impeller seat has an embedded groove accommodating a first end of the bearing assembly, a groove wall of the embedded groove has a plurality of second limiting parts in the circumferential direction, and the plurality of second limiting parts are respectively limited within the plurality of the first limiting parts.

[0014] According to the rotor assembly of an embodiment of the present disclosure, the magnetic ring assembly includes an iron core assembly, a first cover plate, a second cover plate and a sleeve;

the first cover plate, the iron core assembly, and the second cover plate are sleeved on the bearing assembly in sequence, and the iron core assembly is interference-fitted with the bearing assembly, both of an inner circle of the first cover plate and an inner circle of the second cover plate are sealed and fixedly

connected to the bearing assembly; and the sleeve is sleeved on the iron core assembly, and the sleeve is sealed and fixedly connected to an outer circle of the first cover plate and an outer circle of the second cover plate respectively.

[0015] According to another aspect of the present disclosure, there is provided an electronic water pump, including a housing and the rotor assembly according to the above aspect;

the housing has an inner cavity and a rotation shaft located in the inner cavity, and the rotor assembly is accommodated in the inner cavity and is rotatably sleeved on the rotation shaft.

[0016] In the embodiments of the present disclosure, the coaxiality between the magnetic ring assembly and the bearing assembly is ensured by the interference-fit between the magnetic ring assembly and the bearing assembly, and then the magnetic ring assembly and the bearing assembly which are interference-fitted are connected to the impeller seat. Therefore, in the embodiments of the present disclosure, the number of insert injection molding processes is reduced when manufacturing the rotor assembly, thereby ensuring the dynamic balancing accuracy of the rotor assembly, avoiding vibration of the electronic water pump with the rotor assembly during operation, prolonging the service life of the electronic water pump, and at the same time avoiding the generation of noise that causes pollution to the environment.

[0017] It should be understood that the above general description and the detailed description hereinafter are merely exemplary and explanatory and do not limit the present disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate embodiments consistent with the disclosure and together with the description, serve to explain the principles of the disclosure. Obviously, the drawings in the following description are only some embodiments of the present disclosure. For those of ordinary skill in the art, other drawings can be obtained based on these drawings without exerting creative efforts.

FIG. 1 is a schematic structural diagram of a rotor assembly provided by the related art.

FIG. 2 is a schematic structural diagram of a rotor assembly provided by an embodiment of the present disclosure.

FIG. 3 is an exploded schematic diagram of a partial structure of a rotor assembly provided by an embodiment of the present disclosure.

FIG. 4 is a partial structural schematic diagram of another rotor assembly provided by an embodiment of the present disclosure.

FIG. 5 is a schematic structural diagram of another rotor assembly provided by an embodiment of the present disclosure.

FIG. 6 is a partial structural schematic diagram of a rotor assembly provided by an embodiment of the present disclosure.

Reference signs:

[0019]

1. Bearing assembly; 2. Magnetic ring assembly; 3. Impeller seat; 4. Impeller cover;
11. First central through hole; 12. First limiting part; 13. Shaft sleeve; 14. Bearing;
21. Iron core assembly; 22. First cover plate; 23. Second cover plate; 24. Sleeve;
31. Second limiting part; 32. Bushing.

DETAILED DESCRIPTION

[0020] Example embodiments will now be described more fully with reference to the accompanying drawings. Example embodiments may, however, be embodied in various forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided so that the present disclosure will be thorough and complete and will fully convey the concepts of the example embodiments to those skilled in the art. The same reference numerals in the drawings indicate the same or similar structures, and thus their detailed descriptions will be omitted. Furthermore, the drawings are merely schematic illustrations of the present disclosure and are not necessarily drawn to scale.

[0021] Although relative terms, such as "up" and "down" are used in this specification to describe the relative relationship of one component indicated by an icon to another component, these terms are used in this specification only for convenience. For example, according to the direction of the example described in drawings, it will be understood that if the device indicated by the icon is turned upside down, the component described as being "up" would become the component being "down". When a structure is "on" another structure, it may mean that the structure is integrally formed on the other structure, or that the structure is "directly" placed on the other structure, or that the structure is "indirectly" placed on the other structure through another structure.

[0022] The terms "a", "an", "the", "said" and "at least one" are used to indicate the presence of one or more elements/components/etc. The terms "include" and "have" are used to indicate an open-ended sense of inclusion and mean that there may be additional elements/components/etc. in addition to those listed. The terms "first", "second", "third" etc. are only used as a marker, and not as quantitative limitations on their objects.

[0023] The embodiment of the present disclosure pro-

vides an electronic water pump, including a housing and a rotor assembly. The housing has an inner cavity and a rotating shaft located in the inner cavity. The rotor assembly is accommodated in the inner cavity and is rotatably sleeved on the rotating shaft.

[0024] The housing wall of the housing has a water inlet and a water outlet that communicate with the inner cavity. When the electronic water pump is in operation, the rotor assembly is connected to the external power supply and rotates. The fluid enters the inner cavity of the housing along the water inlet. At this time, the rotor assembly converts its own mechanical energy into kinetic energy of the fluid to promote the fluid to flow out along the water outlet at a higher flow rate.

[0025] The specific structure of the housing can refer to the related art. The rotor assembly mainly includes a shaft sleeve 13, a magnetic ring assembly 2, an impeller seat 3 and an impeller cover 4. The magnetic ring assembly 2 includes an iron core and magnetic steel. For details, see the embodiment shown in FIG. 2 below.

[0026] In the related art, the rotor assembly is molded by at least two injection molding processes. As shown in FIG. 1, the magnetic ring assembly 2 (iron core and magnet steel) is first injection molded as an embedded part to obtain a first injection molded part including the impeller seat 3 (containing part) and the magnetic ring assembly 2 (contained part). Then, the first injection molded part obtained by injection molding is used as an embedded part to obtain a second injection molded part including the first injection molded part (contained part) and the shaft sleeve 13 (containing part). Finally, the impeller cover 4 is fixed on the impeller seat 3 of the second injection molded part to obtain the rotor assembly.

[0027] In the related art, at least two insert injection molding processes are required to produce the rotor assembly. The inventor found that it is difficult to ensure the coaxiality of the containing part and the contained part during the insert injection molding process. Therefore, the more times insert injection molding processes are performed, the more difficult it is to ensure the dynamic balance accuracy of the rotor assembly. In this way, the electronic water pump with the rotor assembly will vibrate during operation, thereby reducing the service life of the electronic water pump. In addition, it will make a lot of noise and cause environmental pollution.

[0028] FIG. 2 shows a schematic structural diagram of a rotor assembly of an electronic water pump according to an embodiment of the present disclosure. As shown in FIG. 2, the rotor assembly includes a bearing assembly 1, a magnetic ring assembly 2, an impeller seat 3 and an impeller cover 4. The bearing assembly 1 has a first central through hole 11. The first central through hole 11 is configured to be sleeved on the rotating shaft, and the end of the bearing assembly 1 has a first limiting part 12. The magnetic ring assembly 2 is sleeved on the bearing assembly 1. The magnetic ring assembly 2 is interference-fitted with the bearing assembly 1. At least one end of the bearing assembly 1 extends out of the magnetic

ring assembly 2. The impeller seat 3 wraps the end of the bearing assembly 1, and the impeller seat 3 has a second limiting part 31 in limiting fit with the first limiting part 12 for limiting purpose. The impeller cover 4 is fixedly connected to a side of the impeller seat 3 away from the bearing assembly 1.

[0029] In the embodiment of the present disclosure, the coaxiality between the magnetic ring assembly 2 and the bearing assembly 1 is ensured through the interference-fit between the magnetic ring assembly 2 and the bearing assembly 1, and then the magnetic ring assembly 2 and the bearing assembly 1 which are interference-fitted are connected to the impeller seat 3. Therefore, in the embodiment of the present disclosure, the number of insert injection molding processes can be reduced when the rotor assembly is produced, thereby ensuring the dynamic balance accuracy of the rotor assembly, avoiding vibration of the electronic water pump with the rotor assembly during operation, and extending the service life of the electronic water pump while avoiding noise pollution to the environment. In addition, in the embodiment of the present disclosure, after the impeller seat 3 is formed by injection molding on the first end of the bearing assembly 1, the relative rotation between the bearing assembly 1 and the impeller seat 3 can be limited by the cooperation of the first limiting part 12 and the second limiting part 31, thereby avoiding the phenomenon of slipping between the bearing assembly 1 and the impeller seat 3, and ensuring the efficiency of the rotor assembly.

[0030] The first limiting part 12 is a limiting groove, and the second limiting part 31 is a limiting block; or, the first limiting part 12 is a limiting block, and the second limiting part 31 is a limiting groove, as long as a limit fit of the first limiting part 12 and the second limiting part 31 can be realized, and the embodiment of the present disclosure is not limited to this. The first end of the bearing assembly 1 extends out of the magnetic ring assembly 2, and the second end of the bearing assembly 1 extends out of the magnetic ring assembly 2 or is flush with the end surface of the magnetic ring assembly 2.

[0031] In the embodiment of the present disclosure, the impeller cover 4 and the impeller seat 3 are welded and fixed. Specifically, the impeller cover 4 and the impeller seat 3 are fixed by ultrasonic welding. Of course, other connection methods are also possible, as long as the fixed connection between the impeller cover and the impeller seat can be achieved, and the embodiment of the present disclosure is not limited to this.

[0032] In some embodiments, as shown in FIG. 3, the magnetic ring assembly 2 mainly includes an iron core assembly 21. The iron core assembly 21 has a second central through hole. The iron core assembly 21 is sleeved on the bearing assembly 1 based on the second central through hole. The iron core assembly 21 is interference-fitted with the bearing assembly 1 to ensure the coaxiality between the iron core assembly 21 and the bearing assembly 1.

[0033] The iron core assembly 21 includes the above-

mentioned iron core and magnetic steel. The iron core and the magnetic steel can be produced in advance through an one-piece molding process to ensure the coaxiality of the iron core and the magnetic steel. The one-piece molding process of the iron core and the magnetic steel can refer to the related art. Of course, the iron core and the magnetic steel can also be obtained through other processes, as long as the coaxiality of the iron core and the magnetic field can be ensured, and the embodiment of the present disclosure is not limited to this.

[0034] In some examples, the inner wall of the second central through hole has a protrusion, and the outer wall of the bearing assembly 1 has a groove that matches the protrusion; or the inner wall of the second central through hole has a groove, and the outer wall of the bearing assembly 1 has a protrusion that matches the groove. The protrusion and groove are all along the axial direction of the second central through hole. In this way, through the cooperation of the protrusion and the groove, the contact area between the iron core assembly 21 and the bearing assembly 1 is increased, while relative rotation of the iron core assembly 21 and the bearing assembly 1 is further prevented.

[0035] In order to achieve sealing of the iron core assembly 21, as shown in FIG. 3, the magnetic ring assembly 2 also includes a first cover plate 22, a second cover plate 23 and a sleeve 24. The first cover plate 22 and the second cover plate 23 are sleeved on the bearing assembly 1 and are respectively located at both ends of the iron core assembly 21. That is, the first cover plate 22, the iron core assembly 21, and the second cover plate 23 included in the magnetic ring assembly 2 are sleeved on the bearing assembly 1 in sequence, and the inner circle of the first cover plate 22 and the inner circle of the second cover plate 23 are sealed and fixedly connected to the bearing assembly 1. The sleeve 24 is sleeved on the iron core assembly 21, and the sleeve 24 is sealed and fixedly connected to the outer circle of the first cover plate 22 and the outer circle of the second cover plate 23 respectively.

[0036] In this way, through the connection of the first cover plate 22 and the second cover plate 23 to the bearing assembly 1 respectively, and the connection of the first cover plate 22 and the second cover plate 23 to the sleeve 24 respectively, a sealing cavity for accommodating the iron core assembly 21 can be formed, so as to achieve the sealing protection of the iron core assembly 21.

[0037] All of the connection between the first cover plate 22 the bearing assembly 1, the connection between the second cover plate 23 and the bearing assembly 1, the connection between the first cover plate 22 and the sleeve 24, and the connection between the second cover plate 23 and the sleeve 24 can be welded. Specifically, laser welding can be used. Of course, other connection methods are also possible, as long as the sealing protection of the iron core assembly 21 can be achieved, and the embodiment of the present disclosure is not limited to this.

ited to this.

[0038] In some embodiments, as shown in FIG. 4 or FIG. 5, the bearing assembly 1 includes a shaft sleeve 13. The shaft sleeve 13 has a first central through hole 11, and the end of the shaft sleeve 13 has a first limiting part 12. The shaft sleeve 13 is configured to be rotatably sleeved on the rotating shaft.

[0039] The shaft sleeve 13 can be configured as an embedded part, and the impeller seat 3 is formed on the end of the shaft sleeve 13 through an insert injection molding process. Of course, the impeller seat 3 can also be obtained by pre-injection molding, and then the impeller seat 3 is connected to the end of the shaft sleeve 13 while ensuring the limiting fit of the first limiting part 12 and the second limiting part 31.

[0040] Since both the shaft sleeve 13 and the rotating shaft are rigid parts, the friction between the shaft sleeve 13 and the rotating shaft is relatively large when the rotor assembly rotates. Therefore, in order to reduce the friction between the shaft sleeve 13 and the rotating shaft, when the impeller seat 3 is formed by injection molding, as shown in FIG. 4 or FIG. 5, a bushing 32 is also formed on the inner wall of the first central through hole 11. That is to say, the impeller seat 3 has a bushing 32 extending along the axial direction of the shaft sleeve 13 and fitting with the hole wall of the first central through hole 11. In this way, when the rotor assembly rotates, the bushing 32 is in direct contact with the rotating shaft and rotates relatively, thereby avoiding contact between the shaft sleeve 13 and the rotating shaft.

[0041] When the bushing 32 rotates relative to the rotating shaft, in order to avoid wear of the bushing 32 and reduce friction at the same time, a material with good mechanical property such as high temperature resistance and wear resistance can be selected for injection molding to form the impeller seat 3 with the bushing 32. For example, the material of the impeller seat 3 includes PPS (Polyphenylene sulphide).

[0042] In other embodiments, as shown in FIG. 2 or 6, the bearing assembly 1 includes a shaft sleeve 13 and a bearing 14. The bearing 14 has a first central through hole 11. The shaft sleeve 13 is sleeved on the bearing 14 and interference-fitted with the bearing 14. The impeller seat 3 wraps at least one of the end of the bearing 14 and the end of the shaft sleeve 13.

[0043] The interference-fit between the shaft sleeve 13 and the bearing 14 can ensure the coaxiality of the shaft sleeve 13 and the bearing 14 to ensure the dynamic balance accuracy of the rotor assembly. The bearing 14 is configured to be rotatable limited on the rotating shaft. The first end of the bearing 14 and/or the first end of the shaft sleeve 13 can be injection molded as an embedded part to obtain the impeller seat 3.

[0044] In some embodiments, at least one of the outer wall of the bearing 14 and the outer wall of the shaft sleeve 13 has a first limiting part 12. The outer wall of the bearing 14 and the outer wall of the shaft sleeve 13 can be specifically determined according to the positional relation-

ship between the bearing 14 and the shaft sleeve 13.

[0045] The first end of the bearing 14 extends out of the first end of the shaft sleeve 13. At this time, the first end of the bearing 14 is wrapped by the impeller seat 3, and the first end of the bearing 14 has a first limiting part 12, so that the first limiting part 12 of the bearing 14 cooperates with the second limiting part 31 on the impeller seat 3 for limiting purpose. Alternatively, as shown in FIG. 2, the first end of the bearing 14 and the first end of the shaft sleeve 13 are both wrapped by the impeller seat 3, and the first end of the bearing 14 and the first end of the shaft sleeve 13 both have a first limiting part 12, so that the first limiting part 12 on the shaft sleeve 13 and the first limiting part 12 on the bearing 14 cooperate with the second limiting part 31 on the impeller seat 3 for limiting purpose.

[0046] Of course, it is also possible that the first end of the bearing 14 does not extend out of the first end of the shaft sleeve 13. In this case, the first end of the shaft sleeve 13 is wrapped by the impeller seat 3, and the first end of the shaft sleeve 13 has a first limiting part 12, so that the first limiting part 12 at the first end of the shaft sleeve 13 cooperates with the second limiting part 31 on the impeller seat 3 for limiting purpose.

[0047] In the embodiment of the present disclosure, as shown in FIG. 2, first limiting parts 12 are provided on the outer side walls of the bearing 14 near both ends to prevent reverse mounting when the bearing 14 is assembled with the shaft sleeve 13, thus improving the assembly efficiency.

[0048] In order to reduce the friction between the bearing 14 and the rotating shaft when the rotor assembly rotates and avoid wear of the bearing 14, a material with good mechanical property such as high temperature resistance, wear resistance, and self-lubrication can be selected to make the bearing 14. For example, the material of the bearing 14 is graphite, that is, the bearing 14 is a graphite bearing.

[0049] In some examples, in order to further ensure the tight fit between the shaft sleeve 13 and the bearing 14, one of the outer wall of the bearing 14 and the inner wall of the shaft sleeve 13 has a groove, and the other has a protrusion limited in the groove. In this way, through the cooperation of the groove and the protrusion, the contact area between the shaft sleeve 13 and the bearing 14 is increased, and at the same time, the relative rotation of the shaft sleeve 13 and the bearing 14 is further prevented. In some embodiments, the side wall of the end of the bearing assembly 1 has a plurality of first limiting parts 12 in the circumferential direction, and the impeller seat 3 has an embedded groove that accommodates the first end of the bearing assembly 1. The groove wall of the embedded groove has a plurality of second limiting parts 31 in the circumferential direction. In this way, the possibility of relative rotation between the bearing assembly 1 and the impeller seat 3 can be avoided through the corresponding limiting of the plurality of first limiting parts 12 and the plurality of second limiting parts 31. Tak-

ing the first limiting part 12 as a limiting groove and the second limiting part 31 as a limiting block as an example, the plurality of second limiting parts 31 are correspondingly limited in the plurality of first limiting parts 12.

[0050] Of course, it is also possible that the side wall of the end of the bearing assembly 1 has a plurality of first limiting parts 12 along the axial direction, and the groove wall of the embedded groove has a plurality of second limiting parts 31 in the axial direction, as long as it does not affect the formation of the impeller seat 3 with the bearing assembly 1 as an embedded part, and the embodiment of the present disclosure is not limited to this.

[0051] The present disclosure has been described through the above-mentioned embodiments, but it should be understood that the above-mentioned embodiments are only for the purpose of examples and illustrations, and are not intended to limit the present disclosure to the scope of the described embodiments. In addition, those skilled in the art can understand that the present disclosure is not limited to the above embodiments, and more variations and modifications can be made according to the teachings of the present disclosure. These variations and modifications all fall within the protection scope of the present disclosure. The protection scope of the present disclosure is defined by the appended claims and their equivalent scope.

Claims

1. A rotor assembly of an electronic water pump, comprising:

a bearing assembly comprising a first central through hole, wherein the first central through hole is configured to be sleeved on a rotating shaft, and an end of the bearing assembly has a first limiting part;

a magnetic ring assembly sleeved on the bearing assembly, wherein the magnetic ring assembly is interference-fitted with the bearing assembly, and at least one end of the bearing assembly extends out of the magnetic ring assembly;

an impeller seat wrapping the end of the bearing assembly, wherein the impeller seat has a second limiting part in limiting fit with the first limiting part; and

an impeller cover fixedly connected to a side of the impeller seat away from the bearing assembly.

2. The rotor assembly according to claim 1, wherein the bearing assembly comprises a shaft sleeve, and the impeller seat has a bushing extending along the axial direction of the shaft sleeve and fitting with a hole wall of the first central through hole.

3. The rotor assembly according to claim 2, wherein a material of the impeller seat comprises polyphenylene sulfide.
4. The rotor assembly according to claim 1, wherein the bearing assembly comprises a shaft sleeve and a bearing;
 - the bearing has the first central through hole, the shaft sleeve is sleeved on the bearing and is interference-fitted with the bearing; and the impeller seat wraps at least one of an end of the bearing and an end of the shaft sleeve.
5. The rotor assembly according to claim 4, wherein the bearing is a graphite bearing.
6. The rotor assembly according to claim 4, wherein one of an outer wall of the bearing and an inner wall of the shaft sleeve has a groove, and the other has a protrusion limited in the groove.
7. The rotor assembly according to claim 4, wherein at least one of an outer wall of the bearing and an outer wall of the shaft sleeve has the first limiting part.
8. The rotor assembly according to any one of claims 1 to 7, wherein a side wall of the end of the bearing assembly has a plurality of first limiting parts in a circumferential direction, and the impeller seat has an embedded groove accommodating the end of the bearing assembly, a groove wall of the embedded groove has a plurality of second limiting parts in the circumferential direction, and the plurality of second limiting parts are respectively limited within the plurality of the first limiting parts.
9. The rotor assembly according to any one of claims 1 to 7, wherein the magnetic ring assembly comprises an iron core assembly, a first cover plate, a second cover plate and a sleeve;
 - the first cover plate, the iron core assembly, and the second cover plate are sleeved on the bearing assembly in sequence, and the iron core assembly is interference-fitted with the bearing assembly, both of an inner circle of the first cover plate and an inner circle of the second cover plate are sealed and fixedly connected to the bearing assembly; and
 - the sleeve is sleeved on the iron core assembly, and the sleeve is sealed and fixedly connected to an outer circle of the first cover plate and an outer circle of the second cover plate respectively.
10. An electronic water pump, comprising a housing and the rotor assembly according to any one of claims 1

to 9;
the housing has an inner cavity and a rotation shaft located in the inner cavity, and the rotor assembly is accommodated in the inner cavity and is rotatably sleeved on the rotation shaft.

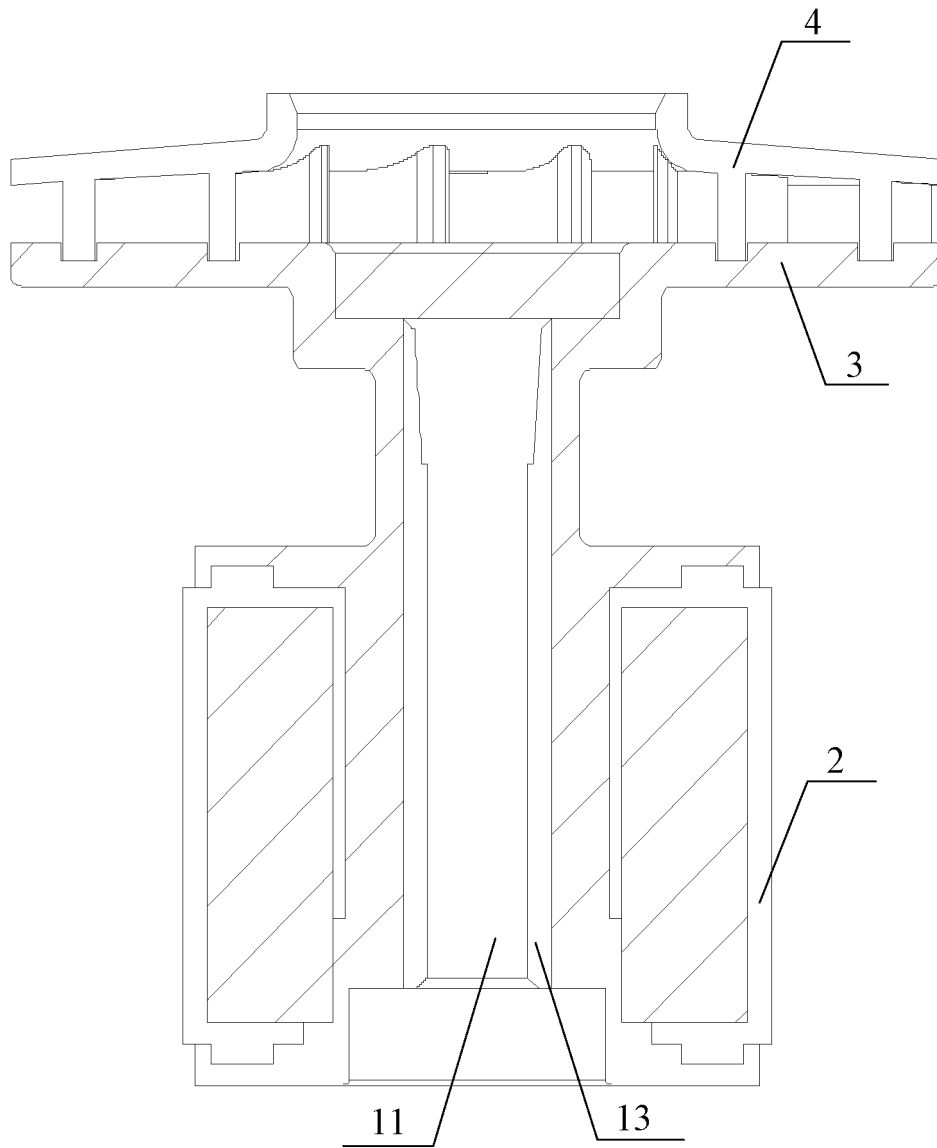


FIG. 1

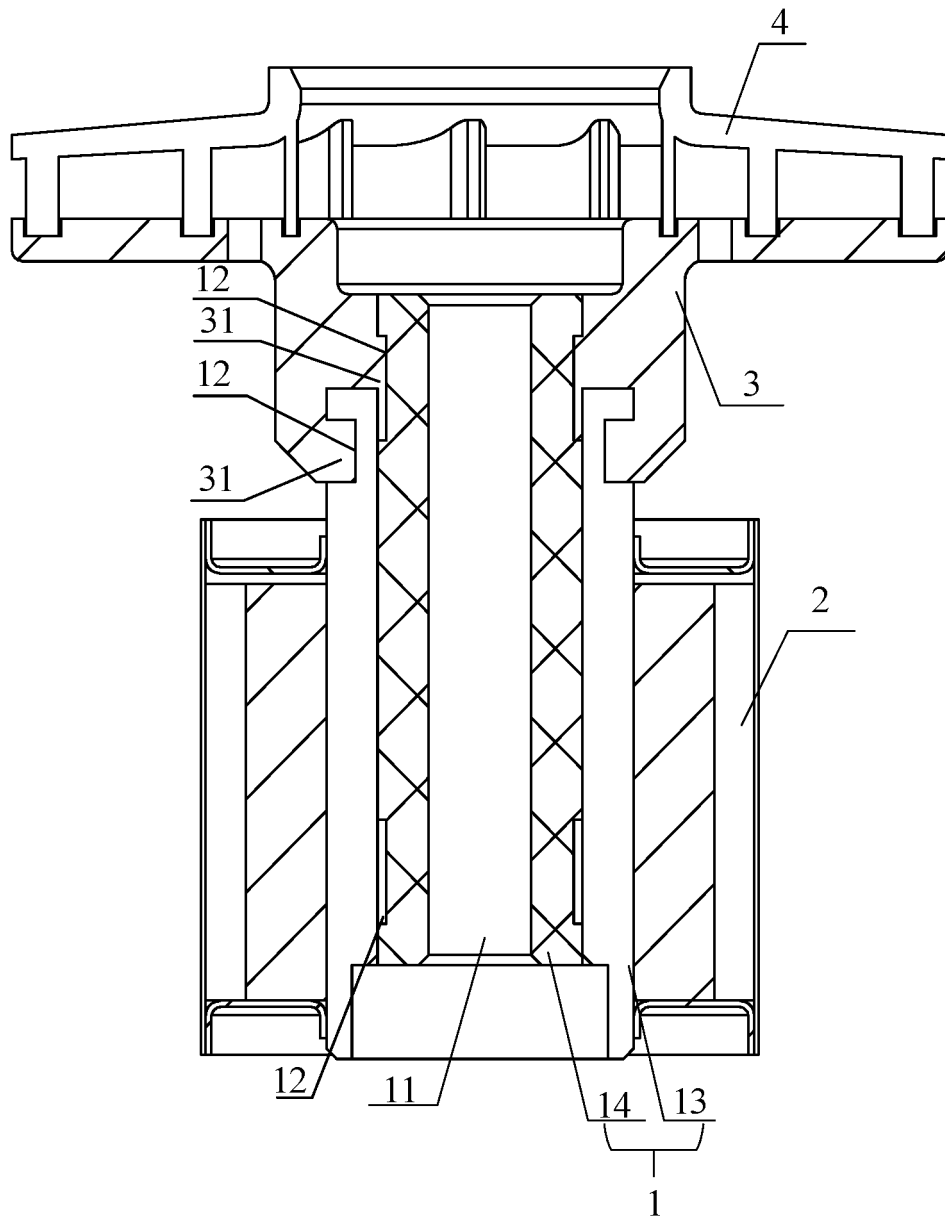


FIG. 2

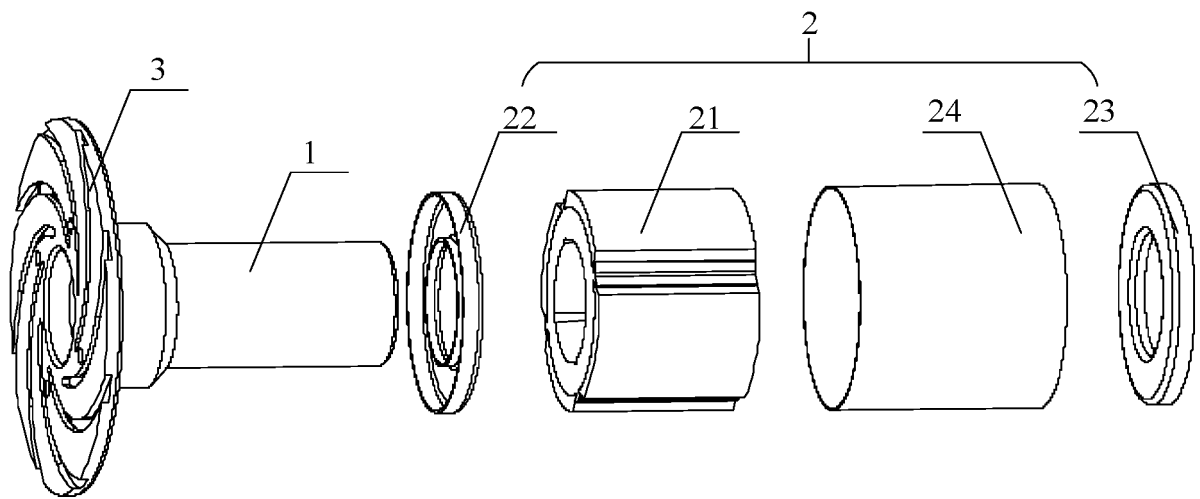


FIG. 3

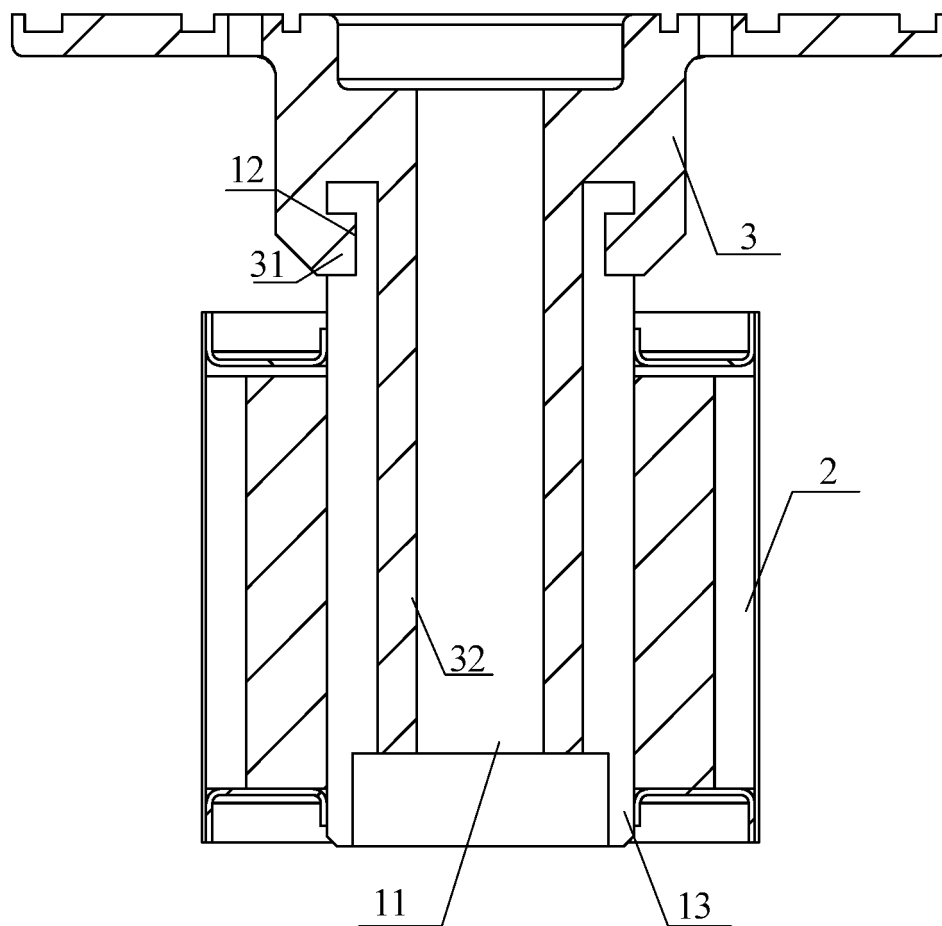


FIG. 4

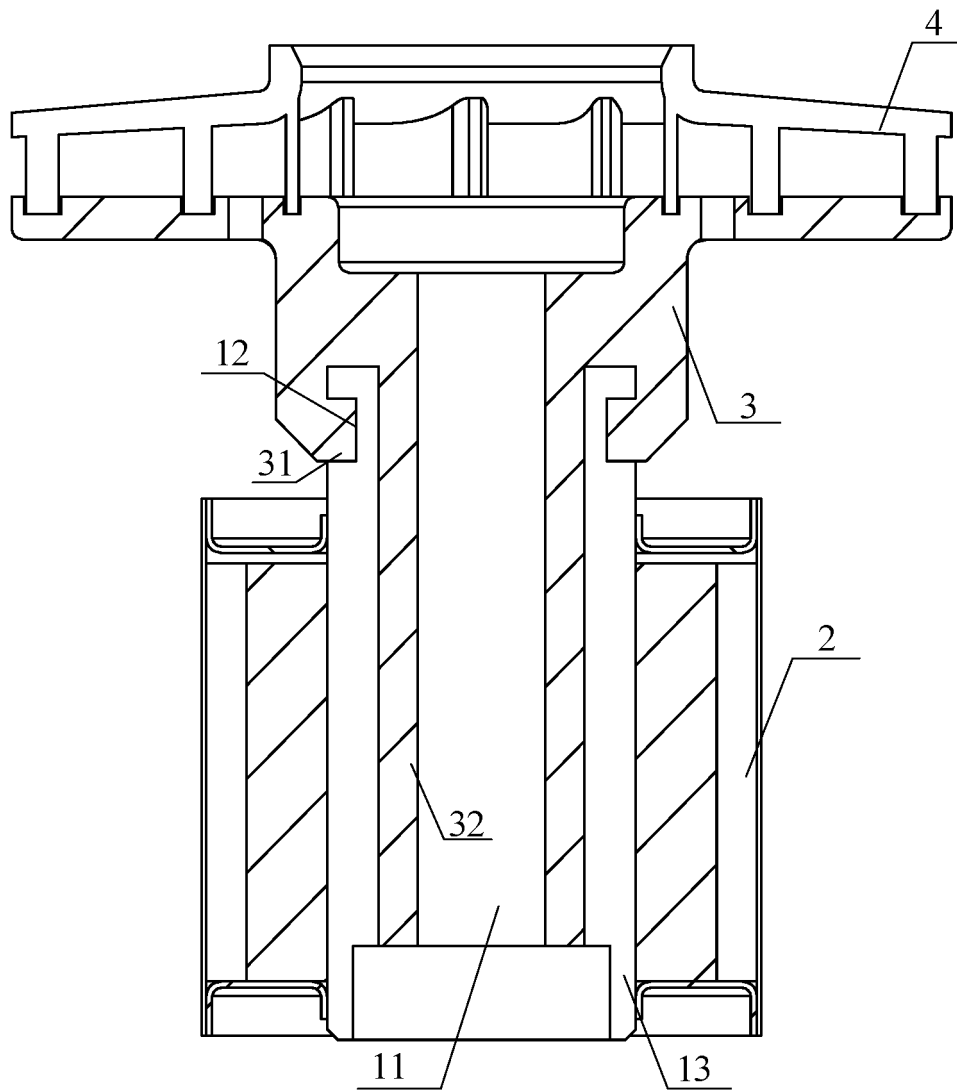


FIG. 5

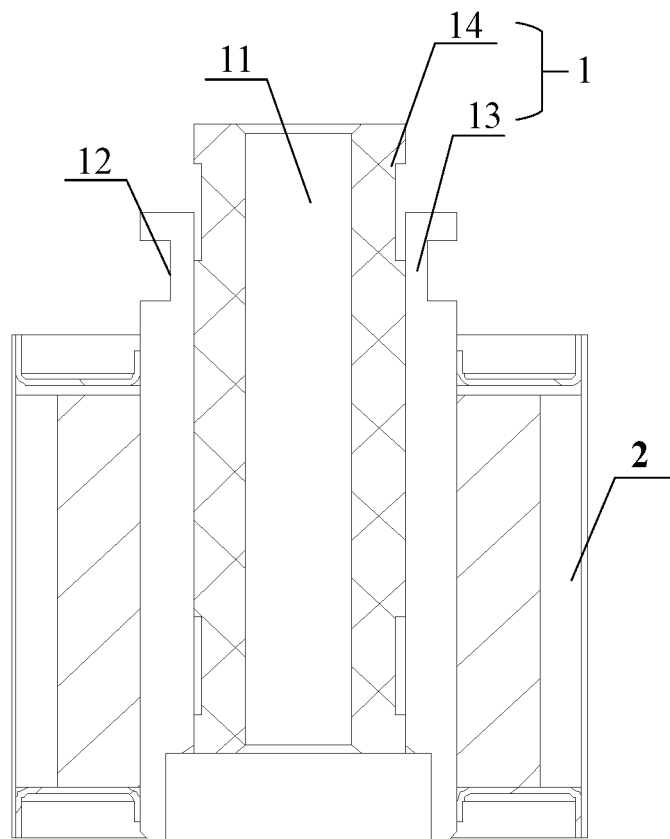


FIG. 6

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2022/133383

A. CLASSIFICATION OF SUBJECT MATTER F04D13/06(2006.01);F04D29/62(2006.01);F04D29/044(2006.01)i According to International Patent Classification (IPC) or to both national classification and IPC																				
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) F04D Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched																				
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) CNTXT, ENTXT, DWPI: 轴承, 轴套, 衬套, 转子, 磁, 铁芯, 铁心, 过盈, Bearing, sleeve?, Bush+, Rotor+, Magnet+, core?, Interferenc+, transition+																				
C. DOCUMENTS CONSIDERED TO BE RELEVANT																				
<table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>Y</td> <td>CN 112268004 A (JIANGSU LANGXIN ELECTRIC CO., LTD.) 26 January 2021 (2021-01-26) description, paragraphs [0041]-[0052], and figures 1-7</td> <td>1-10</td> </tr> <tr> <td>Y</td> <td>JP 2013100742 A (ASMO CO., LTD.) 23 May 2013 (2013-05-23) description, paragraphs [0017]-[0049], and figures 1-5</td> <td>1-10</td> </tr> <tr> <td>Y</td> <td>CN 213870317 U (JIANGSU LANGXIN ELECTRIC CO., LTD.) 03 August 2021 (2021-08-03) description, specific embodiments, and figures 1-3</td> <td>1-10</td> </tr> <tr> <td>PX</td> <td>CN 216278538 U (DUN'AN AUTOMOBILE THERMAL MANAGEMENT TECHNOLOGY CO., LTD.) 12 April 2022 (2022-04-12) description, paragraphs [0043]-[0068], and figures 1-6</td> <td>1-10</td> </tr> <tr> <td>A</td> <td>CN 213331654 U (RUILI GROUP RUIAN AUTO PARTS CO., LTD.) 01 June 2021 (2021-06-01) entire document</td> <td>1-10</td> </tr> </tbody> </table>	Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	Y	CN 112268004 A (JIANGSU LANGXIN ELECTRIC CO., LTD.) 26 January 2021 (2021-01-26) description, paragraphs [0041]-[0052], and figures 1-7	1-10	Y	JP 2013100742 A (ASMO CO., LTD.) 23 May 2013 (2013-05-23) description, paragraphs [0017]-[0049], and figures 1-5	1-10	Y	CN 213870317 U (JIANGSU LANGXIN ELECTRIC CO., LTD.) 03 August 2021 (2021-08-03) description, specific embodiments, and figures 1-3	1-10	PX	CN 216278538 U (DUN'AN AUTOMOBILE THERMAL MANAGEMENT TECHNOLOGY CO., LTD.) 12 April 2022 (2022-04-12) description, paragraphs [0043]-[0068], and figures 1-6	1-10	A	CN 213331654 U (RUILI GROUP RUIAN AUTO PARTS CO., LTD.) 01 June 2021 (2021-06-01) entire document	1-10		
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Date of the actual completion of the international search 01 February 2023	Date of mailing of the international search report 20 February 2023																			
Name and mailing address of the ISA/CN China National Intellectual Property Administration (ISA/CN) China No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088 Facsimile No. (86-10)62019451	Authorized officer Telephone No.																			

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INTERNATIONAL SEARCH REPORT

International application No. PCT/CN2022/133383

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C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2006056992 A1 (SADLER CHRISTOPHER;BROWN DAVID E;JOHNSON RAYMOND M;) 16 March 2006 (2006-03-16) entire document	1-10

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Information on patent family members

International application No.

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CN 112268004 A	26 January 2021	None	
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REFERENCES CITED IN THE DESCRIPTION

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